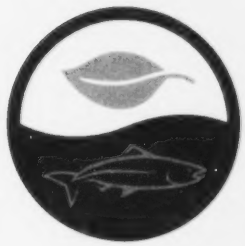

Pacific Fisheries Resource Conservation Council

Annual Report 2003

Pacific Fisheries Resource Conservation Council Annual Report 2003

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For further information about this document and about the Pacific Fisheries Resource Conservation Council (PFRCC), contact:
Pacific Fisheries Resource Conservation Council
800 Burrard Street, Suite 590
Vancouver, BC, Canada V6Z 2G7
Telephone 604 775 5621
Fax 604 775 5622
www.fish.bc.ca
info@fish.bc.ca

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Pacific Fisheries Resource Conservation Council
Conseil pour la conservation des ressources halieutiques du pacifique

March 2004

The Hon. Geoff Regan
Minister of Fisheries & Oceans
Government of Canada
Ottawa

The Hon. John van Dongen
Minister of Agriculture, Food & Fisheries
Government of British Columbia
Victoria

Dear Ministers:

On behalf of the members of the Pacific Fisheries Resources Conservation Council, I am presenting this sixth annual report. Our mandate calls for the presentation of this report to both of you and to British Columbians each year.

Our report presents a summary of the advice and recommendations we have recently provided, and contains further observations on the status of wild salmon and steelhead stocks and their freshwater and ocean habitat.

The Council recently reached a milestone of five years since its inception in September 1998. We felt that it would be appropriate at this stage to provide a report card on the information and advice we have provided. We decided that an evaluation of our activities and some measurement of the Council's usefulness would be in order. As a consequence, this report presents a retrospective of our reports and the recommendations they contained to provide an account of the forms and extent of government action they provoked.

All of us wish to thank Carl Walters and Frank Brown for serving as valued colleagues. Carl and Frank completed their terms as Council members in 2003; they provided wise counsel and lively opinions in all our deliberations. We welcome the appointment of Marilyn Murphy who brings a wealth of knowledge from the sports fishing perspective.

Our work activities expanded significantly during 2003. For instance, we were intensely involved in seeking solutions to the aquaculture controversies, investigating salmon stocks in the central and northern coastal areas, and preparing information for the public on low water conditions affecting salmon.

We have appreciated the opportunity to deal directly with you as your ministerial council. Your accessibility and the involvement of your officials and fellow legislators has enabled us to obtain information and help inform British Columbians about the salmon resource and its future.

John A. Fraser

Chairman

590 - 800 Burrard Street
Vancouver, British Columbia
Canada V6Z 2G7

Tel/Tel: (604) 775-5621
Fax/Téléc: (604) 775-5622
E-mail: info@fish.bc.ca
Web Site/Site Web: www.fish.bc.ca

590 - 800 rue Burrard
Vancouver, Colombie-Britannique
Canada V6Z 2G7

Pacific Fisheries Resource Conservation Council
Conseil pour la conservation des ressources halieutiques du pacifique

Mars 2004

L'honorable Geoff Regan
Ministre des Pêches et des Océans du Canada
Gouvernement du Canada
Ottawa

L'honorable John van Dongen
Ministre de l'Agriculture, de l'Alimentation
et des Pêches
Gouvernement de la Colombie-Britannique
Victoria

Messieurs les ministres,

J'ai l'honneur de vous présenter le sixième rapport annuel du Conseil pour la conservation des ressources halieutiques du Pacifique, conformément au mandat du Conseil dans lequel il est prévu que celui-ci doit faire annuellement rapport de ses activités auprès de vos deux ministères ainsi qu'auprès des citoyens de la Colombie-Britannique.

Le rapport résume les avis et les recommandations que nous avons récemment formulés; il contient également des observations sur l'état des stocks de saumon sauvage et de saumon arc-en-ciel et sur la qualité de leurs habitats dulcicoles et marins.

Le Conseil a été créé en septembre 1998. Pour marquer ces cinq ans d'existence, nous avons cru opportun de faire le bilan des avis et informations que nous avons fournis au cours de cette période. Et nous avons pensé que le moment était venu de faire une évaluation des activités et de l'utilité du Conseil. Vous trouverez donc une rétrospective de nos rapports précédents et des recommandations qu'ils contiennent afin qu'on puisse faire un bilan quantitatif et qualitatif des actions gouvernementales qu'ils ont suscitées.

Les membres du Conseil tiennent à remercier Carl Walters et Frank Brown de leur précieux concours durant leur mandat qui s'est terminé en 2003. Nos discussions ont grandement bénéficié de leurs conseils éclairés et de leur vivacité d'esprit. Nous souhaitons la bienvenue à Marilyn Murphy, qui apporte avec elle sa vaste expérience du secteur de la pêche sportive.

Notre champ d'activité s'est considérablement élargi au cours de l'année 2003. Ainsi, nous avons participé de près à la recherche de solutions aux problèmes très controversés que pose l'aquaculture, nous avons étudié les conditions qui existent dans le centre et le Nord de la côte, et nous avons préparé des documents d'information publique sur les effets de l'abaissement des niveaux d'eau sur le saumon.

Nous sommes heureux d'avoir pu travailler directement avec vous à titre de conseillers ministériels. Votre disponibilité et la collaboration de vos responsables et de vos collègues législateurs nous ont permis d'être mieux informés et, en retour, de mieux informer les citoyens de la Colombie-Britannique sur la situation actuelle et l'avenir de leurs ressources salmonicoles.

John A. Fraser

Président

590 - 800 Burrard Street
Vancouver, British Columbia
Canada V6Z 2G7

Tel/Tel: (604) 775-5621
Fax/TEle: (60-1) 775-5622
E-mail: info@fish.bc.ca
Web Site/Site Web: www.fish.bc.ca

590 - 800 rue Burrard
Vancouver, Colombie-Britannique
Canada V6Z 2G7

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EXECUTIVE SUMMARY

This annual report provides a summary of the 2003 activities of the Pacific Fisheries Resource Conservation Council and reiterates its recent positions on key issues.

In 2003, the Council re-assigned its budget resources by reducing administrative expenses, expanding its projects, and producing more reports and advisories. Its reports on the Salmon Aquaculture Forum and salmon impacts of low water levels and flows were widely acknowledged as valuable contributions to the objectives of fisheries conservation. The Council also continued to pursue issues related to climate change, fisheries management budgets, and fish stock assessment resources.

The Council notes encouraging indicators of improved returns of salmon stocks, but cautions that the results are variable across the watersheds. Improvements have been disappointingly slow. The delays and lack of results from the monitoring and assessment of the Broughton Archipelago pink salmon gave cause for concern about effective follow-up and protection in the upcoming smolt migration.

The Council has remained concerned about the deterioration of salmon habitat conditions, although there have been positive results from riparian and stream restoration projects and other volunteer initiatives. The way in which results-based resource management is being adopted without defining clear conservation results is worrisome.

This annual report reviews how the governments have responded to the Council's advice. The Council noted a generally constructive response on matters related to biodiversity, but observed shortcomings in the governments' action on the recommendations dealing with salmon stock information and management.

The Council's recommendations on information needs for management and public awareness had limited acceptance by the two levels of government, although progress was noted. Where the Council advised on ways to reduce risks to wild salmon and adopt the precautionary approach, much of the response has been through national government-wide initiatives, particularly the new Species at Risk Act.

The policy framework views of the Council on matters such as the Wild Salmon Policy have not yet had significant take-up by either level of government.

For the coming year, the Council plans to publish reports on the north and central coast stocks, northern and transboundary stocks, overescapement, and interaction between wild and enhanced salmon. It also plans to review issues including conduct of the salmon fishery, steelhead stocks and climate change impacts.

SOMMAIRE

Ce rapport annuel fait la synthèse des activités du Conseil pour la conservation des ressources halieutiques du Pacifique concernant l'année 2003, et il contient les positions récentes adoptées par le Conseil sur certains enjeux.

En 2003, le Conseil a réaménagé sa politique budgétaire en réduisant les dépenses administratives. Il a aussi augmenté l'extension de ses projets et produit davantage de rapports et d'avis consultatifs. Les rapports qu'il a produits sur le forum concernant la salmoniculture et sur les impacts salmonicoles de l'abaissement des niveaux et des débits d'eau ont été largement reconnus comme des contributions précieuses à l'avancement des objectifs de conservation de la ressource. Le Conseil a également continué de s'intéresser aux problèmes concernant le changement climatique, aux budgets alloués à la gestion de la ressource et de l'activité de pêche, et aux ressources attribuées aux activités de recensement des stocks.

Le Conseil se félicite des signes encourageants montrés par la hausse des effectifs de remonte, tout en observant que les chiffres sont très variables d'une région à l'autre. Dans l'ensemble, le taux d'amélioration est décevant. Par ailleurs, la lenteur et les aléas du programme d'observation et d'évaluation du saumon rose de l'archipel Broughton rendent le suivi et la protection des prochaines avalaisons de smolts fort problématiques.

Le Conseil demeure préoccupé par la détérioration de l'habitat du saumon, bien que certains projets de restauration de cours d'eau et de ripisylves et diverses initiatives bénévoles assimilées aient donné des résultats encourageants. Il est particulièrement préoccupant de constater que des mesures de gestion axées sur les résultats soient prises sans qu'aient été définis clairement les résultats visés en matière de conservation.

Le présent rapport fait le bilan des actions prises par les gouvernements face aux avis prodigués par le Conseil. On observe que les recommandations portant sur la biodiversité font l'objet d'actions positives, mais que celles concernant l'étude et la gestion des stocks de saumon sont moins bien suivies.

Les recommandations du Conseil concernant les besoins d'information en matière de gestion et de sensibilisation ont rencontré un accueil réservé chez les deux paliers de gouvernement, mais certaines améliorations ont néanmoins été observées. Les actions qui ont suivi les recommandations du Conseil concernant la réduction des facteurs de risque auxquels sont exposés les stocks de saumon sauvage et l'adoption d'une politique de prudence à cet égard se sont généralement inscrites dans le cadre d'initiatives nationales, notamment la nouvelle *Loi sur les espèces en péril*.

Les positions formulées par le Conseil sur des questions comme la Politique concernant le saumon sauvage n'ont pas encore rencontré d'écho significatif chez aucun des deux paliers de gouvernement concernés.

Pour l'année qui vient, le Conseil prévoit publier des rapports sur l'état des stocks du centre et du Nord de la côte, sur les stocks des bassins nordiques et transfrontaliers, sur les excès d'échappement et sur les interactions entre le saumon sauvage et le saumon d'élevage. Nous prévoyons aussi étudier la conduite de l'activité de pêche portant sur le saumon, l'évolution des stocks de saumon arc-en-ciel et les impacts du changement climatique sur la ressource.

1. INTRODUCTION

1.1 Council's mandate

The Pacific Fisheries Resource Conservation Council was created to provide information and advice on Pacific fish populations with an initial focus on wild salmon and steelhead and their freshwater and ocean habitat.

The Council was established in 1998 by the Government of Canada in the wake of public controversy about the adequacy and accuracy of data and available information about the status of salmon and steelhead stocks and the measures that could be taken to improve their sustainability. It serves as an impartial source of advice and information for governments and the public. Its mandate is to present an ecosystem perspective on the long-term strategic priorities that should be taken, and contribute to improvements in the management of the salmon resource.

The Pacific Fisheries Resource Conservation Council deals with matters such as salmon stock trends and enhancement measures, as well as habitat restoration, protection and improvement in terms of their impact on wild Pacific salmon. Much of the Council's work is directed towards identifying and bridging information gaps, especially where the problems might affect or threaten Pacific salmon.

The Council is an independent entity, reporting to the Minister of Fisheries & Oceans Canada, British Columbia Minister of Agriculture, Food & Fisheries, and the general public. It works to integrate scientific information with traditional knowledge and experience of First Nations. It is involved in identifying salmon stocks at risk and in need of conservation measures. It provides information and recommendations on matters such as research programs, stock and habitat assessments and salmon enhancement.

As a ministerial Council, the members have adopted a strategy of working constructively with government and industry officials towards the achievement of conservation objectives. The Council has encouraged the application of scientific methods and public participation in dialogue in formulating its advice.

The public debates over salmon and related fisheries issues have tended to generate heated and unproductive arguments among stakeholders. The Council members do not participate in the confrontation that advocates have often used as a lobbying and public relations tactic.

In some cases, the Council has asked consultants to produce background papers that present information and contribute to more informed public discussion of the issues. It did so in 2003 to obtain current information on aquaculture issues and low-flow impacts on wild salmon. The Council subsequently issued an Advisory concerning aquaculture that contained specific proposals to both levels of government.

1.2 Calendar year basis of this report

Previous annual reports of the Council were on a fiscal-year basis. This is the first that uses a calendar-year as the reporting period. This change is intended to permit the Council to present its information on stock status in a briefer and more timely way in advance of government decisions about fishing and conservation management measures.

Using a calendar-year basis enables the Council to fulfill its mandate to present its annual report in mid-March, prior to the end of the fiscal year.

The annual reports now summarize the Council's current perspectives and consolidate our recommendations that were explained more extensively in the background papers and advisories issued throughout the past year.

1.3 Activities and outcomes

During 2003, the Council increased its level of activity and public visibility through the production of several reports and involvement in current issues.

In January 2003, the background paper entitled *Making Sense of the Aquaculture Debate* was released by its authors who had been asked to produce an analysis of the issues related to netcage salmon farming and wild salmon. The consultants who authored the report suggested a hierarchy of risk factors, starting with disease impacts, from the interaction of farmed and wild fish.

The Council subsequently issued its Advisory entitled *Wild Salmon and Aquaculture in British Columbia*, recommending measures to deal with what has become one of the most controversial public policy issues in the province. This Advisory proposed the adoption of several measures including area management and the creation of a forum for public information and discussion.

Several meetings subsequently took place with ministers and senior officials to identify a practical process for lessening the public discord over salmon aquaculture. This led in April 2003 to the federal and BC fisheries ministers announcing their agreement to establish a Salmon Aquaculture Forum.

The Pacific Fisheries Resource Conservation Council was asked by the Governments of Canada and British Columbia to carry out a process to recommend how the Salmon Aquaculture Forum should be organized and managed. During the summer and fall, the Honourable John Fraser and Ken Beeson conducted extensive discussions with individuals and representatives of organizations throughout the province. A focus of their effort was to ensure full involvement by First Nations leaders and communities. Their discussion paper and briefing note to ministers on behalf of the Council were issued in December and proposed the essential elements of how the Salmon Aquaculture Forum should be set up and ensure widespread public involvement.

In its discussion paper, the Council called for the public release of the federal government's legal opinion on aquaculture jurisdiction that had been purged from a report of the Aquaculture Commissioner. The failure to provide public disclosure in this case has been indicative of the broader problem of not enabling Canadians to become engaged in a meaningful public discussion about salmon aquaculture.

The Council wrote to Pacific region officials of Fisheries & Oceans Canada expressing concern and seeking further information about how the impacts of climate change were being incorporated into fisheries management decision-making and long-term conservation strategies. The Council has endorsed the view of many scientists that changes in environmental conditions affected or induced by climate change should be explicitly accounted for in the assessment and management of salmon stocks.

In September, the Council released a background paper entitled *Conflicts between People and Fish for Water*, authored by Dr. Marvin Rosenau and Mark Angelo. It used the example of two rivers that illustrated the importance of adequate flows and water levels for spawning, incubation and migration of salmon and steelhead. It cited the significance of water extraction and the competition for water that has developed in several watersheds.

Some significant projects by consultants engaged by the Council were initiated during 2003, but not completed by calendar year-end. These included a report on stewardship by the World Fisheries Trust and another on salmon enhancement activities. Two background papers – one on north and central coast stocks and the other on the overescapement concept—were also initiated, but were not due for completion until 2004.

Presentations and briefings were provided to Council members at various times during 2003 by federal and provincial government representatives, specifically dealing with aquaculture research, climate change, fisheries budgets, and fish stock assessment.

Council members participated in several events, including workshops and meetings sponsored by Simon Fraser University, BC Aquaculture Research & Development Committee, Pacific Salmon Commission and the Pacific Stock Assessment Review Committee.

The Council actively tracked the progress of several issues that had been raised during the preceding year, including the pink salmon and sea lice monitoring programs introduced by the two levels of government. This involved meetings with officials to encourage public disclosure of the findings of the monitoring and assessment as soon as they could be made available.

Throughout the year, the Council established a productive working relationship with federal Fisheries Minister Robert Thibault and then with his successor, the Honourable Geoff Regan.

The Council enjoyed the opportunity to work with the Honourable Stan Hagen during his temporary assignment as the BC minister responsible for fisheries issues, and has built a constructive rapport with the Honourable John van Dongen and his officials.

Public consultations involved several stakeholder representatives during 2003. While much of the consultation was in Vancouver Island communities and focused on aquaculture, other fisheries matters were discussed in sessions that included Prince Rupert.

Appearances before committees of the House of Commons and Senate involved Council members explaining how salmon conservation could be improved, and how the precautionary approach in fisheries management should be applied more consistently. The presentation on behalf of the Council to the Finance Committee of the BC Legislature provided an opportunity to suggest that the provincial budget should include an environmental and conservation component.

The Chair and Council members met with several federal fisheries officials during the year, including the new Deputy Minister Larry Murray. Several key personnel changes in Fisheries & Oceans Canada have taken place, and the new officials have been made aware of the Council's availability to provide information and briefings.

2. Stock Status Review

2.1 Conditions

The overall numbers of returns and escapements for each salmon stock tend to mask the considerable variability within and between river systems. For example, sockeye numbers from the Babine Lake system (constituting the largest northern sockeye production) have increased, but declines were noted in the smaller non-Babine systems. The large Babine Lake spawning channels have focused production in that system, while other lakes in the Skeena watershed have not fared well as salmon producers.

In too many cases, the status of salmon production in BC lake systems is difficult to identify or summarize due to limited assessment information.

There were some positive overall indicators of better spawning results in 2003. These appear to be related to reduced fishing pressure and continued strong results in terms of favorable ocean conditions and marine survival.

It is heartening that Fisheries & Oceans Canada is proceeding with the implementation of recovery plans for Interior Fraser coho, Cultus Lake sockeye and Sakinaw Lake sockeye. In the case of this coho stock, the problems of low abundance have persisted while coho in other areas have been rebounding, primarily related to increased ocean survival rates. For Cultus Lake sockeye, the recovery plan has included more extensive assessment to build knowledge about spawning conditions. It has also involved enhancement since 1990 that includes a captive brood stock project.

Sockeye in the Rivers and Smith inlets showed some improvement from their devastated levels of other recent years. In certain areas of the province, steelhead generally continue to be below acceptable levels of abundance, and this situation will be reviewed by the Council in the coming year.

From a long-term perspective in the past decade, it should be observed that harvest rates have been reduced through downsizing of the fishing fleet and restrictions on fishing opportunities for conservation purposes. The overall tonnages of salmon catch now are a fraction of the historic highs during the 1980's. The recreational fishery's conservation success has been in terms of its redirection in the past decade towards catching the more abundant stocks.

2.2 North and central coast findings

While an extensive background paper on the north and central coast stocks is being published by the Council in 2004, there are some initial findings from that research that should be noted in advance.

A significant observation based on this pending background paper is that Pacific salmon are indeed threatened by continued economic development, climate change and human population growth. They also remain a diverse, highly dynamic and resilient group of species.

In northern BC, the total number of chum spawning escapements has declined from as high as one million to about half that number. The chum populations associated with major hatcheries have increased in number of spawners while medium-sized and smaller populations are reduced compared to past years.

For chinook, spawning escapements in many cases have been increasing in central and northern populations, but this trend in improvement has not been consistent across the several watersheds.

The study found that Fisheries & Oceans Canada's budget and management reductions during the past decade have led to substantial decreases in the stream surveys and assessment of salmon populations. In many cases, the historical data that serve as the only reliable basis for comparisons of stock status are not being updated, even though they are needed to be the basis for evaluations of future assessments.

Further reductions in the annual surveys of spawning escapements could fundamentally undermine the capacity to monitor salmon stocks and identify those in need of conservation measures. These reductions in assessments will also affect harvesting opportunities because of uncertainty about the actual status of stocks. An effective assessment program requires that a sufficient number of streams must be surveyed, and that they have carefully established geographic distribution and comparability with historical information.

The continued reductions in funding of salmon assessment are leading to fewer streams being surveyed each year, and to a significant loss in the value of information that was previously collected.

2.3 Broughton Archipelago pink salmon monitoring

In response to the Council's January 2003 Advisory, the BC Government took measures to reduce fish farm activity in the area during the wild pink smolt migration period. Fisheries & Oceans Canada instituted a special monitoring program to measure the extent of sea lice infestation on wild salmon smolts. Together, these initiatives constituted a substantial effort to address this high-profile controversy.

There was, however, no clear indication during 2003 of the direction of changes in the status of pink salmon in the Broughton Archipelago. While some data on the findings were made public, the analysis of the results has taken considerably longer than expected to be analyzed and made available to British Columbians.

3. Habitat Status Review

3.1 Conditions

Evaluations of the status of salmon habitat are difficult because of the general lack of long-term baseline levels of habitat availability or even consensus on how that should be measured. There are obvious broad indicators of deteriorated salmon habitat, such as the disturbance of spawning areas, loss of wetland habitat, and deterioration of water quality and temperature conditions to levels that are not conducive to salmon.

Salmon habitat is affected by natural events, such as fires and severe climate conditions, as well as by human activity. The restoration of habitat conditions can be crucial to many areas that have experienced declines in local salmon populations. The growing involvement of volunteers in stream and riparian restoration was one of the most encouraging trends of the past decade.

Over several years of supporting salmon habitat restoration projects, the federal and BC governments have not generally performed rigorous evaluations of the outcomes and effectiveness of these investments. A result has been that there is insufficient evidence available to justify or disprove the value of such projects, and new funding is all the more difficult to obtain in a situation of tighter budgets. The adoption of thorough evaluations for habitat projects should be encouraged.

The work of habitat restoration and protection needs the continuation of funding that acknowledges the volunteer commitment and provides leverage for further sponsorship and contributions from outside government. Some salmon enhancement projects involve habitat changes, such as improving fish passage, controlling temperatures and flows, increasing habitat complexity, and providing stream and lake nutrients. These arrangements demonstrate ways that habitat conditions can become conducive to improved salmon production.

3.2 Low-water issues

A background paper was published by the Council in 2003 on the impacts of low flows and water levels for spawning, incubation and migration. The Council arranged for this paper to be prepared at the request of the Minister of Fisheries & Oceans Canada who recognized the potential for future problems, given the recent experience of drought and rationing in the states of Washington and Oregon.

Entitled *Conflicts between People and Fish for Water*, the paper explained the hydrological cycle and how instream flows have a determining effect on salmon production. It reviewed the legislative and regulatory basis of British Columbia's water regime, and provided detailed descriptions of two significant salmon and steelhead producing river systems.

The authors, Dr. Marvin Rosenau and Mark Angelo, selected the Englishman River on Vancouver Island and the Nicola River in Interior British Columbia as representative examples of watersheds affected by inadequate flows. They provided extensive evidence of the damage being done by the excessive extraction and diversion of water. They suggested that a more rigorous approach be taken to enforce the British Columbia Water Act and ensure greater fairness in the sharing of water resources between instream uses and those that withdraw water.

The background paper proposed an examination of options for water use by existing tenures and new licenses in a comprehensive and sustainable arrangement that would accommodate fish

needs. The establishment of hydrological budgeting and establishment of effective water storage should be considered in such a plan.

The authors provided their own comprehensive set of recommendations in the report. While the Council did not consider it necessary to issue an Advisory on the subject as it normally does, Council members endorsed the findings and conclusions.

3.3 Results-based management

The Government of British Columbia has embraced a results-based approach in place of prescriptive ways to regulate and ensure efficient resource use and effective environmental protection. In essence, the results-based approach is meant to involve defining objectives and outcomes, and establish flexibility in the ways that companies and individuals can achieve them. It typically involves delegating a greater degree of self-regulation to businesses.

While conceptually valid for some regulatory uses, the results-based approach is not generally appropriate or readily applicable to environmental protection.

The adoption of results-based management as it affects salmon streams and habitat has been proceeding quickly. Its implementation is normally preceded by the essential process of defining the conservation objectives and establishing the specific criteria for measuring achievement of those objectives. For example, is the decline of salmon productivity in an area to be considered a negative "result" of industrial or land development activity? What is the time scale for measuring a "result" when local salmon stocks could be decimated in a relatively brief period?

In adopting the results-based approach, the governments need to lay a clear groundwork in advance of eliminating regulations to measure the results and assign tangible values to fisheries conservation and to the salmon resource for its significance in food production, tourism, and First Nations culture.

4. Follow-Up on Past Recommendations

The members of the Pacific Fisheries Resource Conservation Council chose this year to review their past recommendations to both levels of government in terms of the extent of influence they had on government decisions. They determined that it was not sufficient simply to measure their output in terms of reports and advice, but in the effect they had on government policies, practices and spending.

This evaluation was not easy. In many cases, the Council's advice was general in nature, suggesting a broad policy direction or proposing the adoption of principles that should take priority as decisions are being made.

In some cases, Fisheries & Oceans Canada had specific responses to the Council's reports or comments on each recommendation. In other instances, no official response was received, nor any indication of the acceptance or rejection of what the Council proposed. For its part, the Government of British Columbia has never provided an official response to the reports, although informal discussions have taken place with ministers and senior officials.

The governments responded in some instances by explaining that they were addressing the problems of concern to the Council in ways that differed from what had been recommended, but they were nonetheless taking action.

The Council has, at times, repeated or reinforced the views and recommendations of other organizations and conservation advocates. Where progress has been made in many cases, it has been due to the concerted efforts of many organizations urging action. Where the governments have taken effective conservation measures, it has not necessarily been solely in response to the Council's advice.

Several of the annual and advisory reports of the Council contained similar themes and repeated recommendations where action did not appear to be forthcoming on important salmon conservation problems. The use of essential principles and reference points for decision-making—such as the primacy of the precautionary approach—have been consistently advocated by the Council.

Among the recommendations contained in the Council's reports during the past five years, some have been more crucial than others. Some have been repeated in different forms, but all have reflected a consensus of the views of Council members and have attempted to provide guidance from a conservation perspective.

It is not necessary to provide a checklist for each and every recommendation and whether or not action has been taken on it. A more appropriate approach is to measure the effect of the Council's advice within the five broad categories of its most significant and priority recommendations. Those five categories of advice encompass the most relevant and crucial topics the Council has emphasized as needing careful and decisive action.

4.1 Biodiversity of Pacific salmon

The health of Pacific salmon stocks cannot be measured by sheer numbers alone. Within each of the salmon stocks—coho, sockeye, pink, chinook and chum, plus steelhead—there are many unique populations. The genetic make-up of these populations can differ considerably within each stock, and are thought to be primarily related to their spawning locations and life-history characteristics. The biodiversity of salmon stocks has been declining in recent decades, with several becoming extinct and others being threatened.

The Council has made biodiversity a matter of priority in several of its reports, beginning with its 1999 background papers that cited the need for attention to habitat and freshwater conditions that can undermine entire spawning populations. The Council's first annual report highlighted the importance of maintaining "...biologically diverse and abundant Pacific fish populations". Most of the Council's subsequent reports mentioned biodiversity and recommended measures to protect this distinctiveness.

Fisheries & Oceans Canada has responded to the Council, scientists and environmental organizations by measures to protect small Pacific salmon populations. It has obviously moved away in many cases from the past policies and practices that were meant to produce what was described as being maximum sustained yield. That transition was not easy, given the continuation of pressures to maintain or expand fishing. It was also spurred by Canada's commitments that were defined in international treaties and the work of the Committee on the Status of Endangered Wildlife in Canada.

Fisheries management is considered within the government-wide Canadian Biodiversity Strategy and other policy frameworks. Fisheries & Ocean Canada is considering the Council's comments on this issue in its current review of progress on implementing this strategy.

The science program of Fisheries & Oceans Canada has taken on an increasing interest in identifying the distinct Pacific salmon populations in terms of their locations, physical characteristics and behaviors. The effort to distinguish these populations in terms of their genetic characteristics has begun to yield valuable information and could serve as the basis of a future salmon management regime aimed at conservation of the array of salmon populations, both large and small. It has been suggested to the Council that the reluctance of Fisheries & Oceans to adopt the proposed Wild Salmon Policy is due, in part, to a lack of resources and capacity to obtain sufficiently comprehensive information about the range of salmon biodiversity and the geographic distribution of those populations.

There has been work done to define "evolutionarily-significant units" of the salmon population and set goals for their preservation. At the same time, Fisheries & Oceans Canada has not responded to the Council's advice with a strong commitment to prevent the extinction of small stocks. While the management of small stocks is difficult, especially in periods of declining budget resources, the task is essential.

Some of the Council's concerns about conserving salmon biodiversity are addressed through the federal government's recent introduction of the Species at Risk Act. That legislation can trigger rapid conservation responses in cases where marine and other species are judged to be at risk of extinction. Where unique salmon populations can be identified as being endangered, government agencies are obliged to develop and implement recovery plans.

The Species at Risk Act is expected to be costly, given the obligations it imposes and the after-the-fact remedies it will require. It should eventually have the effect of demonstrating that investments in preventive measures are more cost-effective than repairing environmental damage and coping with salmon stock depletion.

Improved management practices at salmon hatcheries and other operations within the federal Salmon Enhancement Program have been directed towards preventing some of the more significant impacts on the biodiversity of wild salmon. The Council's discussions of enhancement programs in 2004 will focus on the impacts on wild salmon and the need to protect small wild stocks.

4.2 Effective management

The ability of governments to protect salmon stocks and manage the fisheries from a conservation perspective has been an on-going issue for the Council. The multiple use and adequate sharing of the salmon resource for fishing, cultural, community, and eco-tourism purposes can only take place when there are healthy stocks.

The Council does not comment on in-season government management decisions, nor does it attempt to influence the fishing allocation. It does, however, have a mandate to encourage effective management strategies in order to prevent, minimize and mitigate problems that put salmon at risk.

Starting with its first report, the Council strongly endorsed the stringent fishing restrictions to protect coho salmon. The Council's subsequent support for conservation measures for late-summer run Fraser River sockeye in 2002 was based on a similar approach of preventing serious damage to a weakened stock.

The Council has urged the setting of specific and clear escapement goals for stock rebuilding. While both levels of government have stated that they are working towards this arrangement, limited progress has been noted so far. The annual planning for the salmon season tends to involve a black-box management approach that is not readily understood by the public or fisheries stakeholders.

The effective management of the salmon resource is confounded and undermined by the downsizing of staff and budgets by both levels of government at the same time. Over a period of many years, the two governments had built an intricate but effective arrangement of sharing responsibilities for regulating, planning and managing the fisheries and their habitat. The recent withdrawal of staff and elimination of programs by both levels of government has destabilized that seamless arrangement. The ability of the two governments to oversee and enforce their fisheries protection legislation is already compromised by recent budget and personnel reductions. The prospect of even larger reductions in 2004 makes it likely that effective management of Pacific salmon stocks will be further diminished.

Fisheries & Oceans Canada and the BC Government have been working towards the kinds of area-based management arrangements the Council has advocated. The watershed or area management approach could enable more productive use of government resources to manage stocks and coordinate the work of departments and agencies involved in both aquaculture and wild fisheries.

In 2001, the Council issued a report entitled *A Crisis in Fisheries Education* citing the emerging problem of attracting and challenging a new cadre of fisheries scientists and managers. The problems it identified have still not been addressed by the fisheries science community or government managers. The declines in several aspects of the fishery and the reductions in scientific, regulatory and management budgets have discouraged entry into fisheries science. The controversy about salmon aquaculture and its uncertain future prospects may also contribute to discouraging new graduates from seeking careers in this field.

Water use decisions in British Columbia have tended to give precedence to out-of-stream users of the resource. The Council's reports on salmon habitat have illustrated the many instances of fish interests being given insufficient consideration in decisions about agricultural, industrial and land development. It is not apparent that the BC Government currently intends to assign any greater priority to fish uses in decisions about water management. The Council has adopted the strategy of increasing its effort towards public education about water planning and management so that

British Columbians can understand the issues and suggest informed choices to their provincial government.

The Council was among the groups encouraging the Government of Canada to help establish the international arrangements and support habitat restoration to enable the Okanagan watershed to resume its role as a bountiful source of wild sockeye salmon. The initiative of First Nations in the region and the contributions of Fisheries & Oceans Canada have led to the early stages of a valuable restoration that should continue to be expanded.

4.3 Adequate and current information

The Pacific Fisheries Resource Conservation Council was established in the atmosphere of a crisis of public confidence about the credibility of government information on the status of Pacific salmon stocks. An independent public inquiry had found several serious faults in the ways that information about several hundred thousand "missing sockeye" in 1994 was made available to British Columbians and used for management purposes.

The Council has taken the approach of encouraging governments to make information on salmon stock and habitat status more readily available to the public. Its reports have described several voids in data and information that the federal and provincial governments should address to improve their own management of stocks and provide better public understanding of conditions. While the volume of salmon-related information made available by the governments has increased, it should still be considerably more extensive.

The Council has been persistent in calling for additional resources for the enumeration and analysis of salmon stocks. While this information-gathering can be costly, it is essential to monitor the health of Pacific salmon and identify where crisis conditions may be looming. This should involve the use of technologies, such as electronic counting, and careful reference to index streams that serve as proxies for conditions in larger areas. It should also include assurances of continuity of the historical records of escapements that have been built over several decades and serve as crucial reference sources.

Outlined earlier in this report was a brief description of the initial findings from the upcoming Council report on central and north coast salmon. Those findings contained disturbing evidence of the large scale of reductions in salmon assessment by Fisheries & Oceans Canada. That report will demonstrate that further reductions in the annual collection and assessment of data could undermine the validity of salmon stock management decisions.

At the same time, the provision of information to the public from both levels of government about the status and outlook for Pacific salmon has improved somewhat in recent years. The internet has been increasingly used to enable access to data about conditions, catch and stock trends. The government reports on seasonal fishing plans have become more oriented to public understanding.

There is still limited information available from governments about the status of salmon habitat conditions. It is regrettable that little work seems to be done at either level of government to establish criteria for the monitoring and measurement of salmon habitat so that broad trends in habitat availability can be assessed.

The declining levels in the collection of stock status information are not justified by the claim that recent reductions in fishing activity now safely permit this information void to exist. The reduced assessment and lack of reliable information about salmon may soon have the perverse effect of becoming the rationale to adopt an excessively conservative fisheries management strategy. It

would be unfortunate and unnecessary to limit commercial and recreational fishing to levels below those that could be carried out safely and sustainably.

It seems evident to the Council that Fisheries & Oceans Canada has not been placing a sufficient priority on obtaining and using adequate and current information on Pacific salmon. The Council has not been successful so far in convincing either level of government to redirect resources into this essential function; in fact, both governments seem to be moving in the direction of reducing their investment in information.

4.4 Risk minimization

The precautionary approach has been a touchstone for the Council since its inception. This notion was described in the first annual report as being based on an understanding that "...scientific uncertainty about the impacts of human activities upon ecological systems constitutes grounds for restraining potentially harmful activities, rather than an excuse to allow such activities to proceed."

In subsequent reports, the Council observed that fisheries management often seemed to overlook the importance of a precautionary approach. Its acceptance in principle was not matched by any rigorous effort to adopt the approach in practice. This implementation problem has been evident in overly conservative decisions in some instances, rather than failing to act with sufficient regard for the full extent of risks. This inconsistency in using the precautionary approach has undermined its credibility.

To its credit during the past two years, Fisheries & Oceans Canada has participated actively in the government-wide initiative to define the precautionary approach in risk-averse decision-making. In 2003, the Privy Council Office issued a document entitled *A Framework for the Application of Precaution in Science-Based Decision Making About Risk*, setting out principles of application. This should provide a useful and consistent basis for risk assessment in fisheries management and indicates a willingness of the federal government to make the precautionary approach more than an ambiguous concept.

The Council was among the first organizations successfully urging both levels of government to take action to protect and monitor the pink salmon stocks in the Broughton Archipelago. The Council's October 2002 public meeting and subsequent background paper and advisories helped instigate the restrictions on fish farms during the 2003 migration period and the monitoring program for sea lice levels.

The Council strongly supported measures to protect salmon spawning areas that were threatened by the extraction of sand and gravel for construction use. The BC government introduced restrictions on the removal of sand and gravel, in line with the recommendations of a task force. There appears to an impetus to resume sand and gravel extraction to promote economic development. This would be an unfortunate and short-sighted approach that would undermine the salmon resource and its economic potential.

The fisheries management and budget reductions by the governments of Canada and British Columbia are putting Pacific salmon at risk in the sense that fewer resources are available to identify emerging crisis conditions or to mitigate the effects. In the case of the BC government, its adoption of results-based management in the fisheries and habitat protection runs counter to the need for prevention of damage to salmon stocks. In both instances, risk is being increased without justification or consideration of long-term costs and other consequences.

4.5 Policy framework

Several issues have a similarity in terms of the salmon conservation agenda. The Council has provided advice on several of these that constitute an essential policy framework to protect and restore salmon populations.

The Council has consistently urged governments to permit and facilitate public involvement in salmon conservation and management. This has included support for the work of streamkeepers, community advisors, and others involved in volunteer efforts to protect and rebuild salmon stocks and their habitat.

The importance of public groups was recognized and encouraged by governments, especially in recognition of the capacity to establish financial leverage from communities and other sources for investments in salmon-related projects. The Government of Canada's establishment of the Pacific Salmon Endowment Fund was a positive move towards enabling more resources for community projects involving specific watershed recovery efforts.

Public involvement and better understanding of salmon issues were motivations for the Council to propose the Salmon Aquaculture Forum. It has been regrettable that both levels of government have failed so far to take any action to follow through on their April 2003 promise to establish the Salmon Aquaculture Forum.

The development of a Wild Salmon Policy has involved nearly five years of frustrated effort and missed implementation deadlines. The Council has been supportive of the adoption of this policy, and considers it a keystone for the future of salmon conservation. It was expected that Fisheries & Oceans would finally have the policy in place at the end of 2003, in line with the commitment announced for that date by Minister Thibault, but the deadline was not achieved.

The reasons for the interminable delay have not been explained, and one might assume that Fisheries & Oceans Canada is reluctant to acknowledge that wild salmon should come first or be given sufficient priority. This is in addition to the practical problems of identifying unique characteristics of the stocks for management purposes, fitting it with the new Species at Risk Act and establishing an effective area management system. It seems to be compounded by the difficulty in introducing any new policy at the same time as major organizational change is occurring within Fisheries & Oceans Canada.

Whatever the reasons, the failure to enunciate a Wild Salmon Policy has been deeply disappointing to the Council and stakeholders. It offers the opportunity to demonstrate the commitment to wild salmon that is embedded in legislation but has not been reflected to the same extent in government decision-making. Fisheries & Oceans Canada should proceed with the adoption of the policy or scrap the effort and deal separately with each of the key elements of the policy, starting with priority for wild salmon. If the Wild Salmon Policy is too comprehensive to achieve consensus, it might be better to debate and resolve the separate policy components.

5. Council Plans and Objectives

5.1 Shift of resources into projects

The budget for the Pacific Fisheries Resource Conservation Council is allocated by Fisheries & Oceans Canada. In 2003, that amount totaled $850,000, primarily spent on administration, scientific and technical support, secretariat services, studies, and public communications.

The Government of British Columbia provided a further $15,000 in funding under contract for the Council to oversee the preparation of the discussion paper and briefing note on the Salmon Aquaculture Forum. It also made an in-kind contribution by accommodating the schedule of Dr. Marvin Rosenau to take time from his duties as a senior government biologist to co-author the background paper for the Council on low-water flows.

During 2003, the Council reduced the proportion of its costs assigned to overhead, and redirected those funds into technical analysis and production of public information. This change involved the Chairman's voluntary decision to forego a salary with the proviso that the consequent savings would be used for the Council's conservation studies and background papers.

Within its administrative budget, the Council expanded its funding of the website to enable it to become a more informative and convenient source for British Columbians. It also expanded the resources assigned to public consultation to enable the Council to obtain first-hand the views of people from across the province.

While the Council is independent in terms of determining its priorities for investigation and expressing its views on issues, it operates for administrative purposes as a program branch of Fisheries & Oceans Canada.

5.2 Planned 2004 activity

The Council will continue to urge both levels of government to follow through on their April 2003 commitment to implement the Salmon Aquaculture Forum.

The Council will receive and publish the background paper from consultants on hatcheries and other salmon enhancement approaches. It will hold public meetings to enable Council members to obtain the views of British Columbians before issuing an advisory report on any changes that might be suggested for salmon enhancement.

The background paper authored by Dr. Brian Riddell entitled *Pacific Salmon Resources in Central and North Coast British Columbia* is being released in 2004, along with a brief Council Advisory based on the report's findings.

With the pending completion of the two-and-a-half-year secondment of Dr. Brian Riddell and his return to Fisheries & Oceans Canada in April 2004, the Council will have to obtain on-going scientific advice in other ways or rely on scientific consultants and researchers to a greater extent than in the past. Before his departure, Dr. Riddell will complete his work on a report on northern and transboundary stocks and his contribution to a review of the overescapement concept.

Before mid-year, the Council will be reviewing an internal discussion paper in order to consider the emerging fisheries conservation issues from a strategic perspective. This exercise is meant to ensure that the Council renews its workplan to address long-term sustainability and ecosystems, rather than simply responding to immediate problems or crisis conditions.

The workplan for new projects in 2004 has been developed on the assumption of a continuation of the current level of financial resources. A new project planned for the year is a review of the conduct of the salmon fishery. This will involve reviewing the elements of a sustainable commercial, recreational and First Nations harvest, and mapping out a vision of the fishery of the future. It will involve the development of a background paper that puts crucial factors such as technologies, aboriginal rights and multiple uses of the salmon resource into context.

The Council intends to proceed with a study to define habitat trends over time in selected watersheds. This pilot project will involve a ground-breaking initiative to determine easy-to-measure yardsticks to look at trends in habitat in correlation with salmon productivity.

The Council also plans to proceed in 2004 with a long-delayed review of the conservation of steelhead stocks. The persistence of abundance problems in several areas have made this steelhead review increasingly relevant.

The Fraser Valley is a highly-intensive agricultural production area, with fish populations and habitat that are under considerable pressure. The Council's examination of agricultural impacts to salmon and steelhead in this area in 2004 would consider issues of land clearing, changes in stream courses, water utilization, dyking, manure management, chemical fertilizers and pesticides, and riparian vegetation.

The Council intends to follow up on past efforts, including further examination of climate change. It will also pursue on-going issues related to results-based management and low water flows. The members will also put a focus on more clearly defining the application of the ecosystem and precautionary approaches and their use in salmon conservation.

The Council will carry out public consultations in 2004 to a greater extent, beginning with its public meetings on salmon enhancement. It will expand its public information available through the website and introduce educational materials particularly directed towards informing children about salmon conservation.

6. APPENDICES

6.1 Members and staff

The Honourable John A. Fraser is Chairman of the Council. He is a former Minister of the Environment and Fisheries and served as the first elected Speaker of the House of Commons. He headed the Fraser River Sockeye Public Review Board investigating the salmon fishery and was also Canada's Ambassador for the Environment. He is an avid sports fisherman.

Mark Angelo is Program Head and Instructor of the Fish, Wildlife and Recreational Department of the BC Institute of Technology. He is a noted across North America for his work as a river conservationist, habitat expert, and educator, having been awarded the National River Conservation Award.

Mary-Sue Atkinson has become a widely-known volunteer and advocate for fisheries conservation. She has served as a streamkeeper; she has led public awareness campaigns and school programs to expand public awareness about watershed protection and survival of wild salmon.

Murray Chatwin is Vice President for Fisheries Management at Ocean Fisheries Ltd. He has been involved in the fishing sector all of his working life, and serves on an array of advisory committees and industry groups promoting sustainable fisheries practices and research to ensure effective resource use.

Merrill Fearon is the Executive Director of the Federation of BC Writers and has been involved in leading the creation of innovative educational programs and resources, including the Sturgeon General website to educate children about fish. She has worked with community stewardship groups to improve their information programs, and has been a director of the Save Our Fish Foundation.

Dr. Paul LeBlond is Professor Emeritus of Oceanography and Physics at the University of British Columbia. Located on Galiano Island, he has a particular interest in climate change impact. He chairs and serves on several prestigious science panels and advisory boards.

Dr. Jeff Marliave is Vice President of Marine Science at the Vancouver Aquarium. He is an extensively published scientist involved in hands-on research as a diver. He has been instrumental in providing leadership for the Council to deal effectively with several high-profile issues including salmon aquaculture and protection of pink salmon stocks.

Marilyn Murphy is the Executive Director of the Sport Fishing Institute of BC. She has spent her career involved in sportfishing as a fishing guide and lodge manager, contributing to the sustainable use of salmon resources. She is also currently the Chair of the BC Southern Sportfishing Advisory Board. She became a member of the Pacific Fisheries Resource Conservation Council in December 2003.

Marcel Shepert is Fisheries Program Manager and Coordinator for the Carrier Sekani Tribal Council. Located in Prince George, he has been instrumental as a leader and representative of First Nations' interests in resource management, negotiations and conflict resolution.

Dr. Richard Beamish is an ex-officio member representing Fisheries & Oceans Canada.

Arnie Narcisse is an ex-officio member representing the BC Aboriginal Fisheries Commission, an organization he also chairs.

Gordon Ennis—Council's Secretariat Manager

Dr. Brian Riddell—Council's Scientific Advisor

Dory MacLellan—Assistant to the Chairman

Priscilla Singh—Council's Administrator

Ken Floe—Summer Intern / Researcher

6.2 Council publications

1998-1999 Annual Report (Released June 1999).
This report and its four accompanying background papers were the first products of the Pacific Fisheries Resource Conservation Council. They were intended to present, together, a package of information and advice to governments and the Canadian public on the conservation of Pacific fish populations and habitat in British Columbia.

Freshwater Habitat (Background paper authored by Mark Angelo and Marvin Roseau, June 1999)
Salmon and steelhead habitats in British Columbia are almost as varied as the province's geography. The rich biological diversity of species and stocks of salmonids—the family to which salmon and steelhead belong—is an evolutionary response to the physical and chemical variability of the habitats in which these fish live.

Coast-Wide Coho (Background paper authored by Richard Routledge and Ken Wilson, June 1999)
Canada's management and protection of freshwater coho habitat leaves much to be desired. The effect of loss and degradation of freshwater coho habitat in the decline of southern BC coho is complex. There are very few pristine watersheds in southern BC. Loss and degradation of freshwater coho habitat is very widespread. Most biologists agree that we have lost productive coho habitat, and that habitat loss represents a significant long-term threat to wild coho production.

Fraser River Sockeye (Background Paper authored by Richard Routledge and Ken Wilson, June 1999)
This paper detailed historical trends regarding Fraser River sockeye runs. It also addressed management concerns and concludes with recommendations.

Salmon Stocks (Background Paper by Carl Walters and Josh Korman, June 1999)
Providing a broad species-by-species overview of stock status and trends for BC as a whole, this paper presented an overview of the relevant fisheries management issues associated with determining stock status. The initial aim was not to provide a detailed or complete enumeration of all local conservation issues, but rather to highlight major concerns, and to identify needs for more detailed analysis.

Climate Change and Salmon Stocks (October 1999 conference summary)
A one-day workshop, hosted by the PFRCC had a focus on: 'What is the most alarming potential impact of climate change on salmon stocks?' and 'What is the best strategy to adopt?'

Annual Report 1999-2000 (Released May 2000)
This *Annual Report* of the Council reviewed the state of salmon stocks and related habitat conditions, and included particular attention to a set of at-risk areas, salmon populations and habitat situations. It looked at four issues in particular—climate change, *Pacific Salmon Treaty*, salmon in the Central Coast, and strategic management.

Water Use Planning: A Tool to Restore Salmon and Steelhead Habitat in British Columbia Streams (Background paper by Mark Angelo and Marvin Rosenau, May 2000)
Currently, many western North American heritage plants and animals are being lost due to careless use of water and this cannot be rectified until they attain preferred status for access to this important life-giving resource. Salmon and steelhead populations are among the species impacted by excessive human use of water.

Review of the Coho and Chinook Salmon Sections of the "Agreement Under the Pacific Salmon Treaty" between Canada and the United States, dated 30 June 1999 (Background paper by Randall Peterman and Brian Pyper, May 2000)
This report reviewed the "Agreement Under the *Pacific Salmon Treaty*" between Canada and the United States. The terms of reference to the authors from the PFRCC particularly focused this review on how adequately the Aggregate Abundance-Based Management rules specified in the Agreement would deal with conservation issues for Canadian coho and chinook salmon.

Sand and Gravel Management and Fish-Habitat Protection in British Columbia Salmon and Steelhead Streams (Background paper by Marvin Rosenau and Mark Angelo, May 2000)
Sand, gravel and other sediments within and adjacent to spawning and rearing streambeds are fundamental to the productivity of salmon and steelhead stocks. The high levels of production formerly seen in many of British Columbia's chum, pink and sockeye populations were, in part, the result of the conditions of the spawning sediments, primarily gravel, available for these fish. For instance, the quality of the freshwater rearing environment for coho, chinook and steelhead is more crucial than the amount of spawning area.

State of Salmon Conservation in the Central Coast Area (Background paper by Allan Wood, May 2000)
Areas 6-10 of British Columbia's Central Coast were selected for study because this region provides a good measure of the current state of domestic stocks and their management. This is one of the few relatively undeveloped areas left on the coast.

The Wild Salmon Policy and the Future of the Salmonid Enhancement Program (Council Advisory, June 2000)
The March 2000 Wild Salmon Policy Discussion Paper was part of a series of Fisheries and Oceans Canada projects flowing from the New Directions policy initiative which was begun in October 1998. The New Directions initiative is being developed in tandem with Pacific Fisheries Adjustment and Restructuring Program. Fisheries and Oceans engaged in a round of public consultations with respect to its proposed Wild Salmon Policy, as well as the future of the Salmonid Enhancement Program, and the PFRCC provided its views in this Advisory.

Salmon Conservation in the Central Coast (Council Advisory and background paper prepared for the Council by Allan Wood, March 2001)
The conservation status of chinook and coho salmon populations in the Central Coast has become a matter of growing concern. Poor returns of salmon and other important fish species have undermined the commercial and aboriginal fisheries and affected communities throughout the region. The PFRCC's sponsorship of this background paper was intended to provide a factual and analytical basis for the Council members to provide comments and recommendations and to present technical information that can enable the public to understand the situation.

A Crisis in Fisheries Education (Council Advisory, September 2001)
Effective management of fisheries on sound conservation principles is essential if we are to maintain both biodiversity and healthy salmon stocks in British Columbia. The human resources

in the fisheries sector and the skills they apply are increasingly crucial to the success of activities intended to safeguard and enhance the prospects for wild salmon.

The Role of Public Groups in protecting and Restoring Freshwater Habitats in British Columbia, with a Special Emphasis on Urban Streams (Background paper by Marvin Rosenau and Mark Angelo, September 2001)
There has been an upsurge of community and public involvement in the protection and rehabilitation of British Columbia rivers and streams, and an evolution towards a more collective engagement in the management of these resources. This has begun to result in some remarkable successes.

Annual Report 2000-2001 (Released December 2001)
This report provides a preliminary summary of the state of stocks in 2001. It is preliminary because final spawner counts will not be available for a number of months. The report also summarizes research findings and thinking to date on the subject. Lastly, some related issues are discussed, and some important conservation and management questions are put forward.

Late-Run Fraser River Sockeye Mortality (Council Advisory Letter, January 2002)
The 1998 brood Adams River sockeye mortality rate was 36% (850,000 sockeye), but has more recently been as high as 95% during 2000 and 2001. This letter provides recommendations to DFO on how to respond to the situation.

Potential Impacts of DFO Budget Cuts to Salmon Conservation (Council Advisory Letter, August 2002)
This letter to Fisheries & Oceans Minister Robert Thibault addresses the scenarios that might arise as a result of budget cuts to federal government fisheries enforcement, investigation and research capabilities.

Annual Report 2001-2002 (Released October 2002)
This report is innovative in assembling information that is not otherwise available to the public in any other publication. It considers Pacific salmon in four regions of southern BC: Fraser River basin; Okanagan; Strait of Georgia; and West Coast of Vancouver Island. For each region and species, the report summarizes trends in spawning population sizes since the early 1950s, explains the annual monitoring of these populations, and identifies conservation concerns.

The Protection of Broughton Archipelago Pink Salmon Stocks (Council Advisory, November 2002)
The European experience indicates that sea lice abundance can be associated with salmon farming. This advisory makes recommendations on how to safeguard the wild pink salmon runs of the Broughton Archipelago.

Making Sense of the Salmon Aquaculture Debate: Analysis of issues related to netcage salmon farming and wild salmon in British Columbia (Background paper by Julia Gardner and David L. Peterson, January 2003)
The report takes a look behind the debate, examines the information and assumptions supporting the arguments of opposing interests, and deepens the current public understanding about the potential impacts of salmon aquaculture on wild salmon. The report's focus was on the interplay of salmon farming and wild salmon, not all aspects of the potential impacts of salmon farming. Instead, the report concentrates on the most pressing issues pertaining to farmed salmon/wild salmon interactions.

Wild Salmon and Aquaculture in British Columbia (Council Advisory, January 2003)

This Advisory provides information and recommendations for action on the potential and perceived impacts of salmon netcage aquaculture on wild salmon and their habitat in British Columbia.

Annual Report 2002-2003 (Released June 2003)
This annual report puts forward the current findings related to stock status and habitat conditions, and it presents a summary of the Council's viewpoint on some of the most significant and immediate matters of concern. In some instances, the comments summarize and clarify the positions explained in previous Council reports. In other cases, such as salmon aquaculture, this report contains the Council's more recent consensus views.

Conflicts Between People and Fish for Water: Two British Columbia Salmon and Steelhead Rearing Streams in Need of Flows (Background Paper authored by Dr. Marvin Rosenau and Mark Angelo, September 2003)
Using the Nicola and Englishman rivers as examples, this background paper explains how water levels and flows influence the productivity of salmon. It describes the regulatory regimes for water access and how there has been increasing competition for water for urban development, agricultural and industrial uses. It suggests adopting a hydrological budgeting process to allocate water to fish and other uses in a fair and transparent manner, and enforcing the water license system more effectively.

The Salmon Aquaculture Forum: Discussion Paper on Findings & Practices (authored by the Honourable John A. Fraser and Kenneth Beeson, December 2003)
The authors report on their extensive stakeholder discussions and public policy research on best practices across North America and Britain to produce this paper on resolving salmon aquaculture controversies and establishing consensus on the future of fish farming. It cites the importance of First Nations involvement and constructive public participation. It suggests a broader framework and initiatives for government advisory systems to work more productively.

The Salmon Aquaculture Forum: Briefing Note to Ministers (authored by the Honourable John A. Fraser and Kenneth Beeson, December 2003)
This report sets out the principles and criteria for the new Forum, and proposes the key elements that will be necessary to make it acceptable to all participants and effective in fostering public dialogue and understanding of the issues. It offered some alternatives in terms of the scope and scale of the Forum's activity.

590 – 800 Burrard Street
Vancouver, British Columbia
Canada V6Z 2G7
Telephone: (604) 775 – 5621
Facsimile: (604) 775 – 5622
E-mail: info@fish.bc.ca
www.fish.bc.ca